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REMARKS

The Examiner has rejected Claims 1-15 under 35 U.S.C. 103(a) as being unpatentable over Greene ("Hierarchical Polygon Tiling with Coverage Masks"). Applicant respectfully disagrees with this rejection.

In particular, the Examiner relies on the following excerpt from Greene to make a prior art showing of applicant's claimed "far clipping plane that is capable of being updated" (see this and/or similar, but not identical language in each of the independent claims).

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"Instead of automatically culling a portion of a polygon that
intersects a covered cell, it is culled only if it lies
behind the cell's zfar value. At a pixel, we assume that
fragments arrive in an order that permits tiling with coverage
masks, i.e., one or more non-overlapping fragments cover all
of the pixel's samples before any other fragments arrive.
These conditions are easily monitored using the pixel's
coverage mask and znear/zfar values. Unless and until a
fragment violating the conditions arrives, we perform
filtering like the usual algorithm, adding shading
contributions to the accumulation buffer and updating the
pixel's coverage mask. We also cache information about each
fragment in case we need it later. If and when the conditions
are violated, we discard the current accumulated color value
for the pixel and revert to ordinary z-buffering, allocating
the memory required for storing color and depth at each
subpixel sample, and then tiling the cached fragments."
(Greene, page 70, col. 2, Lazy Z-Buffering, lines 31-43)
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The Examiner continues by arguing that "the clipping value zfar is updated corresponding to its cell." Applicant respectfully disagrees with this assertion.

After carefully reviewing this excerpt, along with the remaining Greene reference, applicant respectfully asserts that Greene merely suggests updating a pixel's coverage mask. There is not even a suggestion of any updating of "a far clipping plane," as claimed by applicant. Only applicant teaches and claims updating a far clipping plane, in the manner set forth in the claims.

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The Examiner goes on to admit that Greene does not explicitly teach that the far clipping plane is updated based on the farthest depth value in the hierarchical depth buffer means, as claimed in Claim 1. The Examiner continues by arguing that, "given the dependency of the clipping Znear and Zfar depth values on its covered cell, it would have been obvious to update the Zfar value based on the farthest depth value because it reduces the processing time for clipping the object due to its smaller range in comparisons of depth values in [the] Z-buffer within the covered cell."

Applicant respectfully disagrees with this assertion. First, contrary to the Examiner's assertion, Greene merely suggests updating a <u>pixel's coverage mask</u>, and does not even suggest any updating of "<u>a far clipping plane</u>" (emphasis added), as claimed by applicant. Thus, since Greene does not even consider updating a far clipping plane, it would be *unobvious* to update the far clipping plane in the particular manner claimed by applicant, namely "<u>based on a farthest depth value</u>" (emphasis added).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir.1991).

Applicant respectfully asserts that at least the first and third elements of the *prima facie* case of obviousness have not been met, since the Examiner's proposed modification would not be obvious and further the prior art references, when combined, fail to teach or suggest <u>all</u> the claim limitations. A notice of allowance or a specific prior art showing of each of applicant's claimed elements, in combination with the remaining claimed features, is respectfully requested.

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The Examiner's application of Greene to applicant's dependent claims is further replete with deficiencies. Just by way of example, with respect to Claims 5 and 11, the Examiner relies on the following excerpt from Greene to make a prior art showing of applicant's claimed "wherein the hierarchical depth buffer is in communication with a culling stage."

> "Because of its ability to cull hierarchically in image space, the hierarchical tiling algorithm processes densely occluded scenes much more efficiently than conventional tiling methods, which must traverse all hidden geometry pixel by pixel. Nonetheless, it must still consider every polygon in a scene, doing some work even on those that are entirely hidden. To avoid this behavior, we integrate our algorithm with the hierarchical visibility algorithm [Greene-Kass-Miller93, Greene-Kass94, Greene95] to enable hierarchical objectspace culling of hidden regions of the model. This can be done by substituting hierarchical tiling for z-buffering…" (Greene, page 69, col. 2, Hierarchical Object-Space Culling)

After carefully reviewing the foregoing excerpt and the remaining Greene reference, however, applicant respectfully asserts that such reference makes absolutely no mention of any sort of communication between a hierarchical depth buffer and a culling stage, in the manner claimed.

Again, applicant respectfully asserts that at least the first and third elements of the *prima facie* case of obviousness have not been met, since the Examiner's proposed modification would not be obvious and further the prior art references, when combined, fail to teach or suggest all the claim limitations. A notice of allowance or a specific prior art showing of each of applicant's claimed elements, in combination with the remaining claimed features, is respectfully requested.
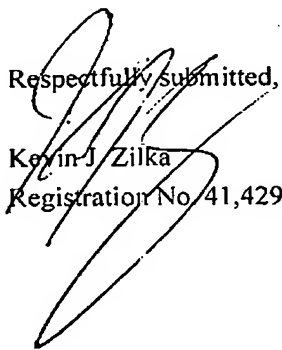
Thus, all of the independent claims are deemed allowable. Moreover, the remaining dependent claims are further deemed allowable, in view of their dependence on such independent claims.

All of the pending claims are thus deemed allowable. A notice of allowance is respectfully requested.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. If any fees

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are due in connection with the filing of this paper, the Commissioner is authorized to
charge such fees to Deposit Account No. 50-1351 (Order No.
NVIDP224B_P000872).

Respectfully submitted,

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